DOCUMENT RESUME

ED 145 168 08 CE 012 824

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TITLE A Study of Articulation Practices in Selected Industrial Education Programs between Public Secondary Schools and Community Colleges in California. Final Report.
INSTITUTION Bureau of Occupational and Adult Education (DHEW/OE), Washington, D.C.
PUB DATE 1 May 77
NOTE 59p.; Page 15 may not reproduce clearly because of a stain

EDRS PRICE MF-$0.83 HC-$3.50 Plus Postage.
DESCRIPTORS *Administrative Personnel; Admissions Counselors; *Articulation (Program); *College School Cooperation; Community Colleges; *Counselors; Educational Research; *Industrial Education; Program Administration; Program Coordination; Secondary Education; Secondary School Counselors; Staff Role; Trade and Industrial Education; Vocational Education; *Vocational Education Teachers
IDENTIFIERS *California

ABSTRACT

The purpose of the study was to ascertain the nature and extent to which articulation practices are used in selected industrial education programs of California public secondary schools and community colleges. Hypotheses were tested for significance of difference in the mean scores between secondary and community colleges at the personnel levels on three articulation dimensions of information, communication, and interaction. The testing was done by having administrators, counselors, and teachers at 50 community colleges and 50% of the secondary schools within the boundaries of these community colleges to complete an articulation information form which had been pilot tested at both educational levels. After analysis of the data, the following conclusions were drawn: Little coordination now exists between administrative levels for purposes of vertical articulation; a lack of vertical articulation exists between counselors at community colleges and public secondary schools; vertical articulation was not apparent between industrial education teachers at the two educational levels studied; professionals who are not directly involved in the delivery of industrial education instruction in the classroom have different perceptions of vertical articulation than do teachers; industrial education faculty at both educational levels do not agree that program interaction exists between the two levels. (BM)

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04-30585-C-7-301

ED145168

A STUDY OF ARTICULATION PRACTICES IN SELECTED INDUSTRIAL EDUCATION PROGRAMS BETWEEN PUBLIC SECONDARY SCHOOLS AND COMMUNITY COLLEGES IN CALIFORNIA

F I N A L R E P O R T

MAY 1, 1977

CALIFORNIA ARTICULATION
RESEARCH PROJECT

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NATIONAL INSTITUTE OF EDUCATION

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PREFACE

This report contains enclosures taken from a dissertation, written by the Project Investigator, which is in progress at the University of Missouri - Columbia.

Material in this report is intended to provide an overview of the methodology used by the California Articulation Research Project and a general summation of the findings in regard to the research questions.

A final copy of the dissutation will provide an in depth review of the articulation elements and their interaction. Final copy will be available on August 1, 1977 upon final approval of the dissertation.

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INTRODUCTION

Introductory Statement

In order to meet the demands of a varied constituency, educational administrators have developed a multiplicity of educational institutions. Each of these educational institutions have variously stated missions with goals that too frequently have not been adequately clarified and understood. Administration of these institutional elements clearly reflect the clouded and often overlapping goals, petty distinctions, and surprising lack of concern for the student as opposed to a concern for the system.

Linksz[1] in his study comments:

> As a result of this relatively recent chronology of growth and its development at a time of conflicting educational ideology, occupational education has not yet produced that concern for inter-level coordination . . .
>
> It is America's commitment to the junior college, itself an inter-level development, which clarifies the need for coordination in the vocational-technical concentrations.

---

[1]James Joseph Linksz, "A Plan for Improving Articulation in Occupational Education Between Public Secondary Schools and Community-Junior Colleges in Maryland." (Unpublished Doctor's Dissertation, Teachers College, Columbia University, 1971), pp. 4-5.

A careful look at the relationship between the comprehensive secondary school and the community college during their development, reveals a traditional concern for articulation. Early in 1932 an articulation conference was held in California between representatives of secondary and higher education.[2] In 1929, the National Education Association's Committee on Superintendents devoted its Seventh Yearbook[3] to the discussion of articulation on all levels. Prior to the 1900's the NEA had several committees whose concern was with admission standards for incoming college students.[4] It was this need for admission standards that ultimately led to the development of accreditation programs for educational institutions. Accreditation was a direct outgrowth of the need for schools to articulate between levels.[5]

More recently a new community college movement grew out of the need for a "universal college" which would

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[2]Frederick C. Kintzer, "California Plan for Articulation." College and University, Vol. 43 (Winter 1968), pp. 155-161.

[3]National Education Association, American Association of School Administrators, Education Policies Commission, Higher Education in a Decade of Decision (Washington, The Association, 1957).

[4]Frederick Rudolph, The American College and University (New York: Alfred A. Knopf, 1962), p. 437.

[5]Robert L. Ebel (ed.), Encyclopedia of Educational Research (4th edition; New York: The MacMillan Company, 1969), p. 26.

embrace grades 11 through 14. The 6-4-4 plan receives uch of its credibility in that the last four years of the plan would encompass the last two years of secondary school and the first two years of community college.[6] The "universal college" although unlikely to be generally adopted at this time, does address the continuing problem of articulating grades 11/12 and 13/14.

Close articulation between grades 11/12 and 13/14 makes good sense under normal student enrollments; in light of the ever increasing population entering occupational programs in community colleges the need becomes more pressing.[7] According to one report the most wasteful and difficult step in the educational ladder is between the last year of secondary school and the first year of college.[8]

The rigidity of both secondary schools and community colleges has placed vocational education in an unprecedented crossfire. The U.S. Government's General Accounting Office report, "What is the Role of Federal Assistance in Vocational

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[6]E. J. Gleaszer, In an address at the "National Conference on Post-Secondary Vocational and Technical Education" (San Antonio, Texas, November 5, 1969).

[7]Angelo C. Gillie Sr., "The Area Vocational Schools and Community Colleges: Cooperation or Confrontation?" Journal of Industrial Teacher Education, Vol. II, No. 2 (Winter 1974), pp. 13-21.

[8]National Education Association, American Association of School Administrators, Education Policies Commission, Higher Education in a Decade of Decision (Washington, The Association, 1957).

Education?" caught numerous vocational educators off guard. The U.S. Government report noted large scale waste of monies and failure of educators to adhere to the law.

> Its (the G.A.O.'s report) major findings is that federal funds, which were supposed to encourage state and local governments to increase the level of their own funding and to devise new programs, have not actually served that purpose at all. Instead, state vocational officials, in many cases, have used the federal money to pay their administrative costs or support traditional programs.
>
> They have simply neglected the law and given money to their old trade-high-school friends, complained one observer.[9]

The General Accounting Office also found other major weaknesses in present vocational education programs. These weaknesses are:

1. Planning (local/state/national)
2. Articulation (public schools)
3. Poor placement record
4. Failure to adapt to labor market
5. High school programs were most difficult to change[10]

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[9]Phillip M. Boffey, "Vocational Education: Funds Misused?" The Chronicle of Higher Education, October 29, 1974, p. 5.

[10]United States Comptroller General, "What is the Role of Federal Assistance for Vocational Education?" (Washington: U.S. Government Printing Office, 1974.)

> There is a growing conviction, both in Santa Barbara and beyond, that the coordination of educational enterprise in a given region is too important to be left to chance.[11]

In the State of California, Assemblyman Joseph B. Montoya, Chairman, The Assembly Select Committee on the Implementation of Career Education, has been studying the total delivery system for career education programs in the State of California.

> Montoya recently reported that the widespread rivalry between the high schools and community colleges for adult enrollments constituted open warfare for state educational dollars.
>
> He charged there was widespread waste and duplications resulting from a system of financing which returns to the districts state monies far above the costs of the programs.[12]

The California Advisory Council on Vocational Education and Technical Training (prior to Mr. Montoya's committee work and long before the General Accounting Office's landmark report) found problems in California Vocational Education planning. A primary concern outlined by the council was the need to begin planning to determine the optimum relationship among the secondary schools and community colleges of a given area. Their concern was with the respective roles of the community college and secondary school.

The Council also contemplated ways in which secondary

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[11]E.L. Boyer and others, "Santa Barbara Coordinated Education Project." Education Digest, Vol. 31 (October 1965), p. 4.

[12]Earl G. Waters, "Earl Waters Column," The Chico Enterprise Record. May 28, 1975, page 10C.

schools should interact among themselves, and whether particular parts of a program should be offered in the secondary school or community college.[13]

The evidence suggests that in the State of California there has been resistance to coordination in vocational education and avoidance of planning. The California legislature in a 1975 report[14] stated that:

> The State Plan for Vocational Education is wholly drawn up to comply with federal guidelines. It is not an operational guide, nor is it used to measure progress against what is described.

In California, as well as other states, the lack of vocational planning and articulation is a serious problem. Every school year educational dollars are wasted as a result of program duplication.

California educators, legislators, advisory board members, employers, taxpayers and students will find the results of this study useful in the development of a systematic program of vocational education.

The study will provide the base whereupon legislative and educational personnel can develop and implement an improved system for continuity between school systems and programs.

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[13]California Advisory Council on Vocational Education and Technical Training, Feasibility Study of Career Ladder Curriculum and Guidance and Counseling, (California State Printing Office: January 1971).

[14]California Legislature, Select Committee on the Implementation of Career Education, Who Does What? Duplication, Supervision and Planning in Vocational Education, 1975.

Statement of the Problem

A review of the literature suggests that there could be three major dimensions to the articulation of industrial education programs between secondary and post-secondary school levels. Those three vectors of articulation are the dimensions of information, communication and interaction.

Even though the dimensions of articulation have been previously identified, there is no empirical evidence to indicate the extent to which articulation is taking place in industrial education at the secondary and community college levels in California. It is on this lack of knowledge on which this study is focused.

The three hypothesized dimensions of industrial education articulation were studied as they related to administrators, counselors and industrial education teachers at the secondary school and community college levels as shown in Figure I.

Purpose of the Study

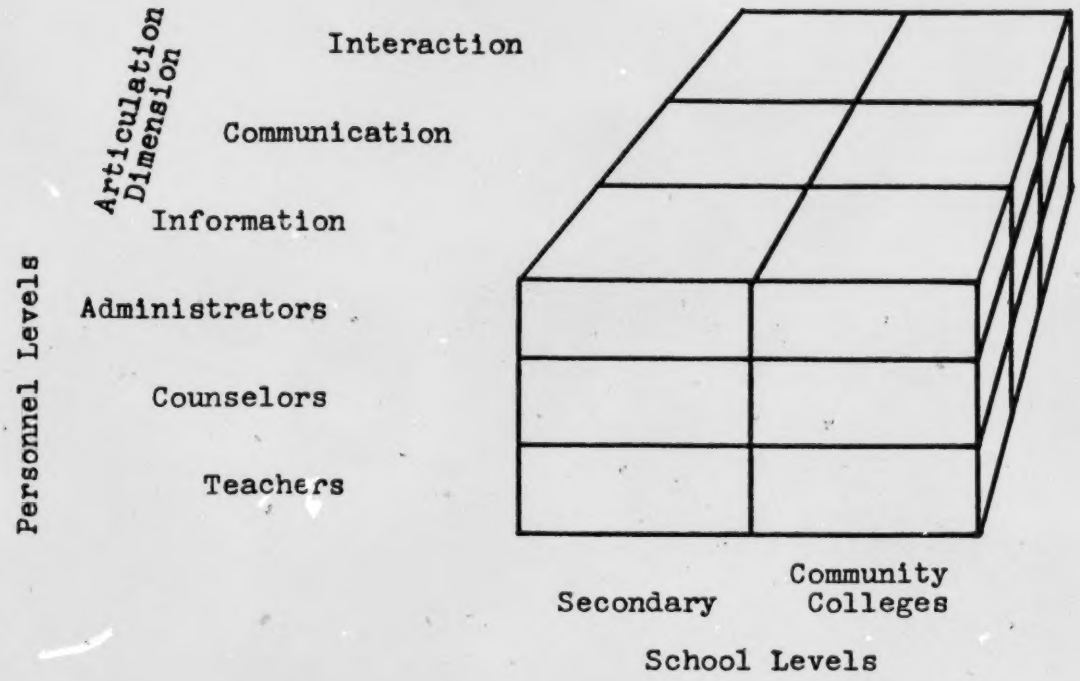
This study was conducted to ascertain the nature and extent to which articulation practices are used in selected industrial education programs of California public secondary schools and community colleges.

The research was guided by the following questions:

1. To what extent are there external information elements (other than face to face contact) operating upon <u>administrators</u> within the California public industrial education system (secondary/community college) in both a planned and unplanned manner?

FIGURE I

MATRIX OF THE ARTICULATION PRACTICES OF SELECTED INDUSTRIAL EDUCATION PROGRAMS BETWEEN SECONDARY SCHOOLS AND COMMUNITY COLLEGES



2. To what extent are there external information elements (other than face to face contact) operating upon counselors within and without the California public industrial education system (secondary/community college) in both a planned and unplanned manner?

3. To what extent are there external information elements (other than face to face contact) operating upon industrial education faculties within and without the California public educational system (secondary/community college) in both a planned and unplanned manner?

4. To what extent are there direct communication elements specific to the facilitation of effective articulation relationships (face-to-face) in industrial education operating upon administrators at the California public secondary school and community college levels?

5. To what extent are there direct communication elements specific to the facilitation of effective articulation relationships (face-to-face) in industrial education operating upon counselors in California public secondary school and community college levels?

6. To what extent are there direct communication elements specific to the facilitation of effective articulation relationships (face-to-face) operating upon industrial education faculties at the California public secondary school and community college levels?

7. To what extent are there actual intermixing and interdependence planned into the interface between administrators responsible for industrial education programs in California public secondary schools and community colleges?

8. To what extent are there actual intermixing and interdependence planned into the interface between counselors responsible for students and potential students in industrial education programs at California public secondary schools and community colleges?

9. To what extent are there actual intermixing and interdependence planned into the interface between industrial education faculties at the California public secondary school and community college levels?

Statement of the Hypothesis

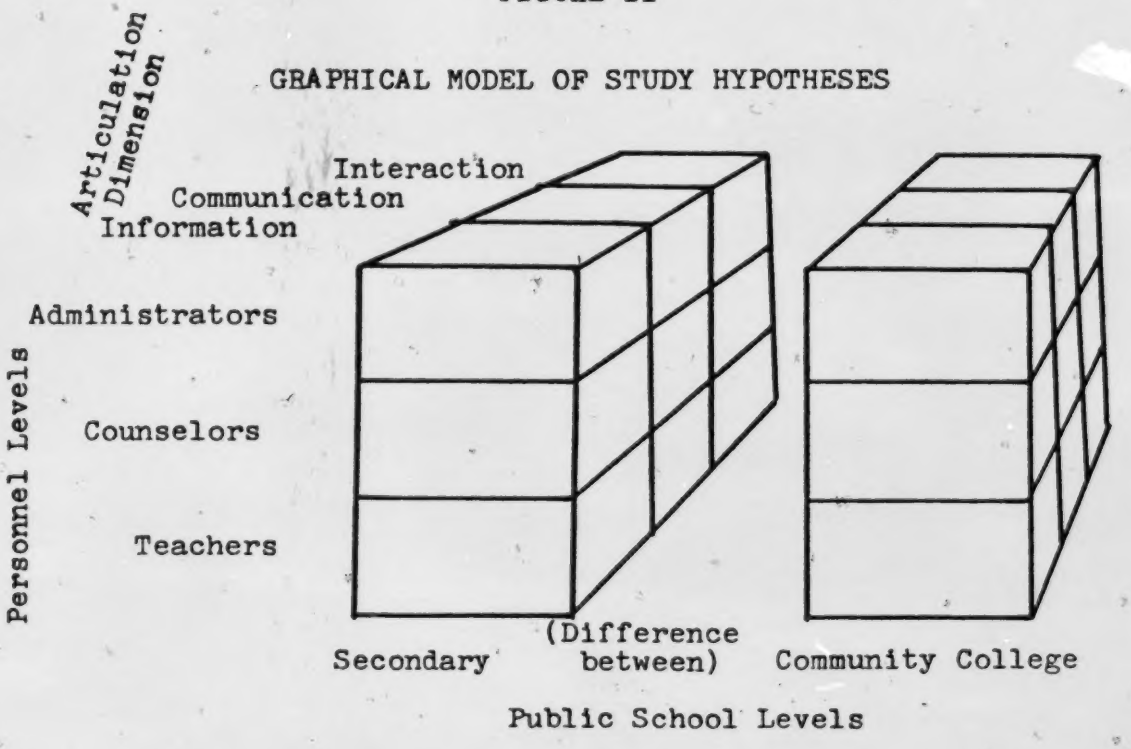
The general research hypothesis of this study was: There will be no significant difference in program information exchange, curricular/program communication and

curricular/program interaction between administrators, counselors and teachers associated with industrial education instruction at the public secondary school and community college levels in California.

As described in Figure II below, hypotheses were tested for significance of difference in the mean scores between the two public school levels of secondary and community colleges at the personnel levels of administrators, counselors and teachers on the three articulation dimensions of information, communication and interaction.

FIGURE II

GRAPHICAL MODEL OF STUDY HYPOTHESES



Stated in the null form for purposes of statistical analysis, the following hypotheses were tested at the .05 level of significance:

HO_1: There is no significant difference among the mean scores on the articulation dimension of information between administrators responsible for industrial education programs at public secondary schools and community colleges in California.

HO_2: There is no significant difference among the mean scores on the articulation dimension between counselors responsible for students and potential students in industrial education programs in California public secondary schools and community colleges.

HO_3: There is no significant difference among the mean scores on the articulation dimension of information between industrial education faculties in California public secondary schools and community colleges.

HO_4: There is no significant difference among the mean scores on the articulation dimension of communication between administrators responsible for industrial education programs in California public secondary schools and community colleges.

HO_5: There is no significant difference among the mean scores on the articulation dimension of communication between counselors responsible for students and potential students in industrial education programs in California public secondary schools and community colleges.

HO_6: There is no significant difference among the mean scores on the articulation dimension of communication between industrial education faculties in California public secondary schools and community colleges.

HO_7: There is no significant difference among the mean scores on the articulation dimension of interaction between administrators responsible for industrial education programs in California public secondary schools and community colleges.

HO_8: There is no significant difference among the mean scores on the articulation dimension of interaction between counselors responsible for students and potential students in industrial education programs in California public secondary schools and community colleges.

HO_9: There is no significant difference among the mean scores on the articulation dimension of interaction between industrial education faculties in California public secondary schools and community colleges.

Definition of Terms

For purposes of this study the following definitions apply:

Articulation is the cooperative effort of educational personnel in the same or different administrative units to provide a continuous program of education from educational level to educational level without duplication or gaps in a program of studies which is directed towards meaningful goals.

> Career Education is teaching and learning appropriate to learners which results both in greater understanding of the individuals as consumers in our industrial society, and in preparation of individuals to enter (re-enter) the job market of that society under the best possible conditions with profit to themselves and others.[15]

> Communication Dimension can be defined in the same way that the Information Dimension elements act externally or indirectly upon individuals, the Communication Dimension is concerned with activities specific to the facilitation of effective articulative relationships-face-to-face contacts between individuals and groups who have

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[15]Bill Wesley Brown, "Six Crucial Issues in Career Education." Career Education (Denver: The National Association of State Boards of Education, 1972), p. 95.

> a capacity to effect positive movement . . . Communication Dimension elements are planned and systematic for the most part and they involve individuals on several levels in the educational hierarchy.[16]

A Community College is an educational institution which provides general education, lower-division university-transfer education, career programs, and continuing education to individuals in the service area of the institution.

Horizontal Articulation is the process of interrelating disciplines on one grade level.

> The Information Dimension concerns primarily external elements which operate upon individuals within and without the educational system in both a planned and unplanned manner. The articulation thus fostered is not of the type which depends upon face-to-face communications concerned directly with promoting effective relationships.[17]

Industrial Education is a generic term applying to all types of educational activities related to the teaching about modern industrial technology. Industrial education is that component of career education which relates specifically to the teaching/learning about industry through career awareness/exploration in industrial arts courses and career preparation/specialization in vocational-industrial education programs and much of technical education.

The Interaction Dimension encompasses the intermixing

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[16]James Joseph Linksz, "A Plan for Improving Articulation in Occupational Education Between Public Secondary Schools and Community-Junior Colleges in Maryland" (Unpublished Doctor's Dissertation, Teachers College, Columbia University, 1971), pp. 66-67.

[17]Ibid. p. 54.

and interdependence planned into the interface between educational levels. This interface involves diverse activities from teacher/counselor exchanges to the shared use of a laboratory facility by various schools in an educational hierarchy.

Occupational Education is teaching and learning involving specific skills and knowledge for entry into and progress in useful employment.

A Secondary School is a school half-way between elementary school and college and usually offering general, technical, vocational or college preparatory courses.[18]

Vertical Articulation (see Articulation).

Vocational Education (see Occupational Education).

Methodology of Study

The study involved administrators, counselors and industrial education faculty employed in public secondary schools and community colleges in California.

Fifty community colleges which offered programs in industrial education were randomly selected for study. Fifty percent of the secondary schools within the sampled community college boundaries were also selected for inclusion in the study.

An information form was developed by the researcher

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[18]Webster's New World Dictionary of the American Language, "Secondary School." Eleventh edition, s.v.

to measure the articulation practices/dimensions of information, communication and interaction. A review of the related literature provided the initial concepts of articulation used to formulate the instrument items.

A pilot study was conducted to test the reliability of the information form and to verify research procedures. The pilot study enabled the researcher to identify certain minor problems in the research procedures and to slightly modify the research instrument.

A three part articulation information form was developed. Analysis of the pilot data revealed a Kuder-Richardson formula twenty of 0.59 for the information sub-element, 0.68 for the communication sub-element and 0.79 for the interaction sub-element. The combined coefficient alpha for the entire test was 0.85.

The pilot study group consisted of administrators, counselors, and industrial education teachers employed in California public schools at two levels: secondary and community college. Fifteen community colleges were randomly selected from a list of all California Community Colleges offering programs in industrial education. All secondary schools identified as within the pilot community college district were included in the pilot group for study. Information forms were then sent to administrators, counselors and industrial education teachers at both levels, secondary and community college. Fifty community colleges were randomly selected from the remaining list of all California Community

Colleges offering programs of industrial education. One half, or 240, of all secondary schools located within each of the community colleges district were randomly selected for the study sample.

Information forms were mailed to administrators, counselors and industrial education teachers at the fifty community colleges and 240 secondary schools.

Data for the final analysis were collected from the sample by mailing each participant a packet containing a cover letter, an articulation practices information form, a DS 1120A answer sheet and a stamped business reply envelope. An overall usable return of 76 percent was received.

The data supplied by the sample respondents were read from the DS 1120A answer sheets and converted to cards by a Control Data Corporation 3150 computer. To provide answers to the research questions, descriptive statistics and multiple discriminant analysis were calculated with the aid of the CDC 3150 computer.

Limitations of the Study

The study, descriptive in nature, was limited to data received from public secondary school/community college administrators, counselors and teachers. The study was limited to the boundaries of the sampled community college districts. The accuracy of the data received from the research instrument was limited by the accuracy of that instrument in ascertaining articulation practices.

The study was further limited in that articulation

practices involve personalities, inter-personal relationships and individual prejudices which might have caused individuals to report deviations from actual procedures and methods of articulation.

The study was limited to California, and generalizations applicable to other geographic areas might have to be withheld pending replication of the study.

SUMMARY, CONCLUSIONS, IMPLICATIONS, AND PROBLEMS FOR FURTHER STUDY

Summary

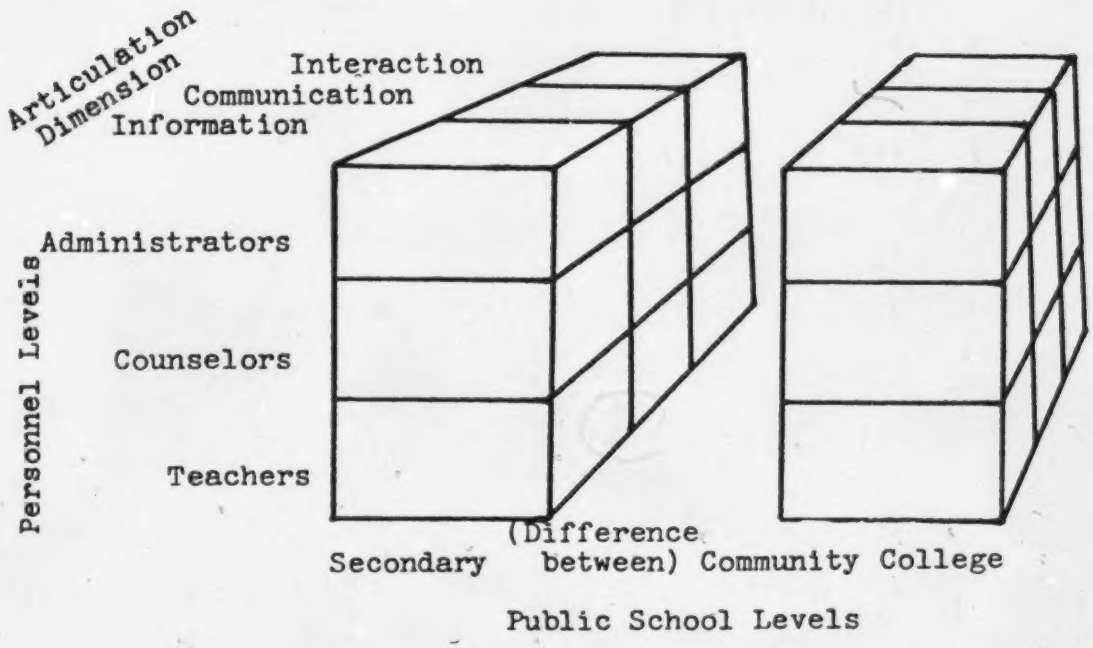
The purpose of this study was to ascertain the nature and extent to which articulation practices are used in selected industrial education programs of California public secondary schools and community colleges.

The general research hypothesis under study was that there will be no significant difference in program information exchange, curricular/program communication and curricular/program interaction between administrators, counselors and teachers associated with industrial education instruction at the public secondary school and community college level in California.

As described in Figure III below, hypotheses were tested for significance of difference in the mean scores between secondary and community colleges at the personnel levels of administrators, counselors and teachers on three articulation dimensions of information, communication and interaction.

FIGURE III

GRAPHICAL MODEL OF STUDY HYPOTHESES



For purposes of statistical analysis the following null hypotheses were tested at the .05 level of significance:

HO_1: There is no significant difference among the mean scores on the articulation dimension of information between administrators responsible for industrial education programs at public secondary schools and community colleges in California.

HO_2: There is no significant difference among the mean scores on the articulation dimension of information between counselors responsible for students and potential students in industrial education programs in California public secondary and community colleges.

HO_3: There is no significant difference among the mean scores on the articulation dimension of information between industrial education faculty in California public secondary schools and community colleges.

HO_4: There is no significant difference among the mean scores on the articulation dimension of communication between administrators responsible for industrial education programs in California public secondary schools and community colleges.

HO_5: There is no significant difference among the mean scores on the articulation dimension of communication between counselors responsible for students and potential students in industrial education programs in California public secondary schools and community colleges.

HO_6: There is no significant difference among the mean scores on the articulation dimension of communication between industrial education faculty in California public secondary schools and community colleges.

HO_7: There is no significant difference among the mean scores on the articulation dimension of interaction between administrators responsible for industrial education programs in California public secondary schools and community colleges.

HO_8: There is no significant difference among the mean scores on the articulation dimension of interaction between counselors responsible for students and potential students in industrial education programs in California public secondary schools and community colleges.

HO_9: There is no significant difference among the mean scores on the articulation dimension of interaction between industrial education faculty in California public secondary schools and community colleges.

The study involved administrators, counselors and industrial education faculty employed in both public secondary schools and community colleges in California.

Fifty community colleges which offered programs in industrial education were randomly selected for study. Fifty percent of the secondary schools with the sample community

college boundaries were also selected for inclusion in the study.

A pilot study was conducted to test the reliability of the information form and to verify research procedures. The pilot study identified some problems in research procedures and modifications needed in the research instrument.

The articulation information form developed consisted of three parts. Analysis of the pilot data revealed a Kuder-Richardson formula twenty of 0.59 for the information sub-element, a 0.68 for the communication element and a 0.79 for the final element. A coefficient alpha of 0.85 was calculated after combining all items of the information form.

The pilot study group consisted of administrators, counselors, and industrial education teachers employed in California public schools at two levels, secondary and community college. Fifteen community colleges were randomly selected from a list of all California Community Colleges offering programs in industrial education. All secondary schools identified as within the pilot community college district were included in the pilot group for study. Information forms were then sent to administrators, counselors and industrial education teachers at both levels, secondary and community college.

The final study sample group consisted of administrators, counselors and industrial education teachers at the two levels of secondary schools and community colleges. Fifty community colleges were randomly selected from the remaining

list of all California Community Colleges offering programs of industrial education. One-half of all of the secondary schools located within each of the community colleges district were randomly selected for the study sample.

Information forms were mailed to administrators, counselors and industrial education teachers at the 50 community colleges and 240 secondary schools.

Data for the final analysis were collected from the sample by mailing each participant a packet containing a cover letter, an articulation practices information form, a DS 1120A answer sheets and a stamped business reply envelope. An overall usable return of 76 percent was received.

The data supplied by the sample respondents were read from the DS 1120A answer sheets and were punched on cards by a CDC 3150 computer. To provide answers to the research questions, descriptive statistics and multiple discriminant analysis were calculated with the aid of a CDC 3150 computer.

Discussion of the Findings

A multiple discriminant analysis statistic and discriptive statistics were used to analyze the data. A significance level of .05 was used as a standard for accepting or failure to accept the null hypotheses.

The results of instruments completed by administrators, counselors and industrial education teachers at California Community Colleges and Public Secondary Schools on the articulation dimensions of information, communication and in-

teraction were compared using a Mahalanobis D-Square technique. As a result of this analysis, the null hypothesis (HO_1), there is no significant difference among the mean scores on the articulation dimension of information between administrators responsible for industrial education programs at public secondary schools and community colleges in California, failed to be accepted.

Utilizing the same statistical technique, the null hypothesis (HO_2), there is no significant difference among the mean scores on the articulation dimension of information between counselors responsible for students and potential students in industrial education programs in California public secondary and community colleges, failed to be accepted.

An analysis using the same technique, the Mahalanobis D-Square, the null hypothesis (HO_3), there is no significant difference among the mean scores on the articulation dimension of information between industrial education faculty in California public secondary schools and community colleges, failed to be accepted.

Utilizing the same statistical technique, the null hypothesis (HO_4), there is no significant difference among the mean scores on the articulation dimension of communication between administrators responsible for industrial education programs in California public secondary schools and community colleges, failed to be accepted.

Using the Mahalanobis D-Square statistic, the null hypothesis (HO_5), there is no significant difference among the

mean scores on the articulation dimension of communication between counselors responsible for students and potential students in industrial education programs in California public secondary schools and community colleges, failed to be accepted.

Repeating the same statistic, the null hypothesis (HO_6), there is no significant difference among the mean scores on the articulation dimension of communication between industrial education faculty in California public secondary schools and community colleges, failed to be accepted.

Utilizing the same technique, the null hypothesis (HO_7), there is no significant difference among the mean scores on the articulation dimension of interaction between administrators responsible for industrial education programs in California public secondary schools and community colleges, was accepted.

The same statistical method, the null hypothesis (HO_8), there is no significant difference among the mean scores on the articulation dimension of interaction between counselors responsible for students and potential students in industrial education programs in California public secondary schools and community colleges, was accepted.

Finally, using the same statistic, the null hypothesis (HO_9), there is no significant difference among the mean scores on the articulation dimension of interaction between industrial education faculty in California public secondary schools and community colleges, failed to be accepted.

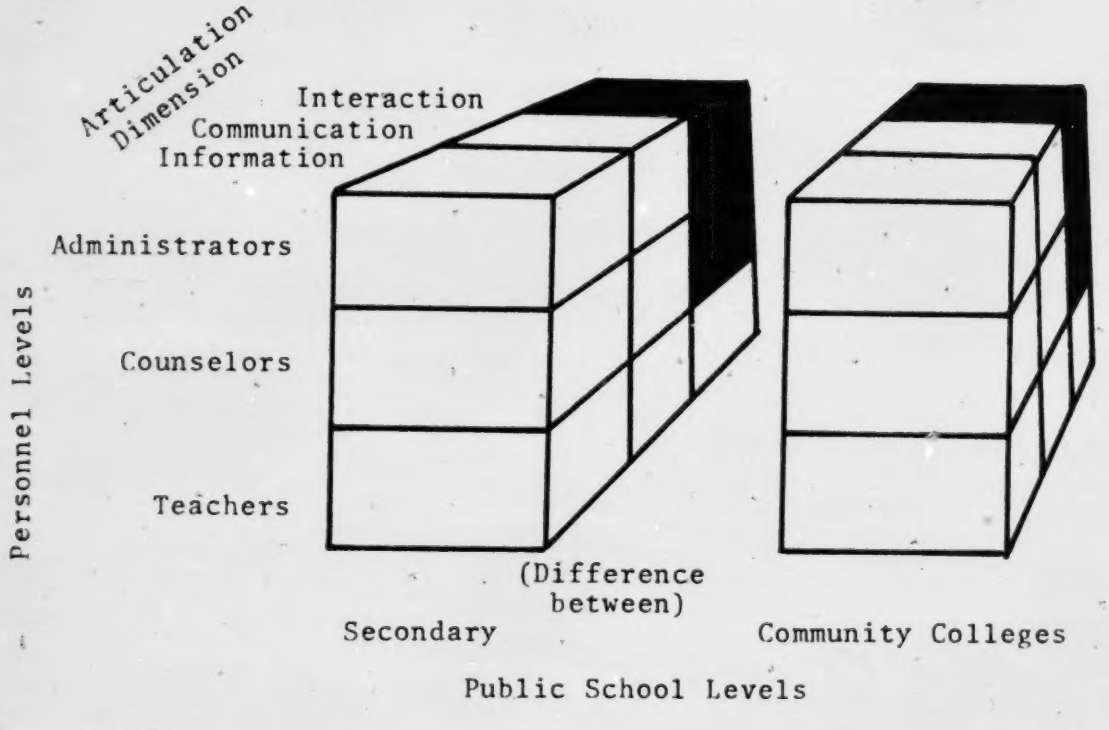
Conclusions

The conclusions which follow were drawn based on the evidence previously presented and should be interpretated to the extent that the data generated by the study resulted from instruments and research procedures that were both valid and reliable.

FIGURE IV

GRAPHICAL MODEL SHOWING

RESULTS OF HYPOTHESIS TESTING



In view of the findings as shown in Figure IV it can be concluded that: little agreement was found to exist

between administrators, counselors and industrial education teachers on the articulation dimensions of information and communication when comparisons were made between perceptions at the Community College level and Public Secondary School level.

Therefore, it may be concluded that (1) little coordination now exists between administrative levels for purposes of vertical articulation (2) a lack of vertical articulation exists between counselors at Community Colleges and Public Secondary Schools and (3) vertical articulation was not apparent between industrial education teachers at the two educational levels studied.

Agreement was found to exist between administrators and counselors, but not industrial education faculty, on the articulation dimension of interaction. Therefore, it may be concluded that (1) professionals who are not directly involved in the delivery of industrial education instruction in classroom have different perceptions of vertical articulation than do teachers and (2) industrial education faculty at both the community college level and public secondary school do not agree that program interaction exists between the two levels.

Implications

In view of the findings and conclusions of this investigation, the following implications are presented.

Since little agreement was found to exist between Community Colleges and Public Secondary Schools on the most of the articulation dimensions, education officials should

consider the development of an articulation model which would be operational on all dimensions at all levels.

Furthermore pre-service and in-service programs should be developed for purposes of preparing professionals with the skills and knowledges necessary to develop meaningful articulation between and within educational levels.

Problems for Further Study

During this investigation, other articulation-related problems of sufficient research merit presented themselves. The problems identified for future research investigation include the following:

1. A study investigating the practices involved in the horizontal (lateral) articulation of industrial education programs.
2. A study to identify a model for the implementation of articulation practices found to be of value in this study.
3. A similar study be conducted between Community Colleges and State Colleges and Universities in California.
4. A similar study be conducted between middle schools and secondary schools in California.
5. A study of articulation in industrial education comparing practices between large urban school districts and small rural districts, multi-district community colleges and single college districts.
6. A study identifying the cost-benefits of implementing an articulated program of industrial education in California.

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